

THE MEXICAN SPECIES OF *CHALCIS* FABRICIUS  
(HYMENOPTERA: CHALCIDIDAE)

B. D. Burks

*Abstract.*—Three new species of *Chalcis* Fabricius from Mexico are described: *nodis*, *colpotis*, and *celis*. A key and descriptions are given of all species of *Chalcis* new known to occur in Mexico. A list is included that shows the current generic placement of all Mexican species described or previously placed in *Smicra* (or *Smiera*) Spinola. At present *Smicra* is considered to be a synonym of *Chalcis* Fabricius.

---

The species of *Chalcis* Fabricius that have been reared are parasites in larvae of stratiomyiid flies. It is likely this is true for all the species, because the adults of *Chalcis* can be collected only in or near aquatic habitats where stratiomyiids are common.

Stratiomyiids deposit their eggs in flat masses on vegetation or other objects just above the water line in cattail bogs or other sloughs. The adult female *Chalcis* has an ovipositor minute enough to pierce a stratiomyiid egg without destroying it. Several species have been observed to feed on some of these eggs but to deposit their eggs in others. It is only while these host eggs are exposed above the water line that stratiomyiids are vulnerable to attack by *Chalcis*.

When a parasitized stratiomyiid egg hatches, the larva migrates into the water, carrying within itself the *Chalcis* embryo. The parasite remains inside the stratiomyiid larva throughout development of the stratiomyiid. When the stratiomyiid larva is mature, it migrates out of the water to pupate in the mud just above the water line. Then the *Chalcis* larva develops rapidly, pupates, and emerges as an adult through a hole it cuts in the skin of the stratiomyiid.

The life history of several species of *Chalcis* has been studied. See Schremmer (1960) for a life history of *Chalcis myrifex* (Sulzer), a common European species.

In the taxonomic literature the Mexican species that are now placed in *Chalcis* Fabricius were placed in the genus *Smicra* (sometimes spelled *Smiera*) Spinola, until 1923. That year Gahan and Fagan (1923) published the statement that *Smicra* and *Chalcis* were isogenotypic and that, as a result, *Smicra* (being more recently described) should be placed as a synonym of *Chalcis*. Further, the name *Chalcis*, long applied to another common chalcidid genus, should be used in the sense of *Smicra*. The species that at that time were placed under *Chalcis* should be placed instead under the generic name *Brachymeria* Westwood. This rather drastic change in the application of commonly used names was accepted by all

subsequent workers except Schmitz, who published on the African Congo species of Chalcididae (Schmitz, 1946).

By the present time an enormous literature has accumulated in which the names *Chalcis* and *Brachymeria* are used as specified by Gahan and Fagan. However, this change in the application of these names was not based on a study of type-specimens but was mostly culled from the "Catalogus Hymenopterorum," published by Dalla Torre (1898). That work is bibliographic and not taxonomic. This case rests largely on an opinion of Dalla Torre about the misidentification of the species *Sphex sispes* Linnaeus by Fabricius in 1789. This is a matter that most certainly should have been submitted to the Secretary of the International Commission on Zoological Nomenclature. This was not done, but instead, Gahan and Fagan simply published statements that the changes should be made.

It would not, at this late date, be advisable to reopen this question and possibly reverse the usage that now has been followed for over 50 years. The Gahan and Fagan application of the name *Chalcis* has been adhered to in recent revisional works that cover a large part of the fauna of the world. It is necessary, however, considering present day usage of the name *Chalcis*, to recatalog all the Mexican species that were placed in *Smicra*, or *Smiera*, before 1923. This is required so that the application of the name *Chalcis* to Mexican species in this present paper may be clear. All the Mexican species that were placed in *Smicra*, or *Smiera*, before 1923 cannot automatically be transferred to *Chalcis*, because *Chalcis* itself has been re-defined since 1923 (Burks, 1940). Most of the old *Smicra*, or *Smiera*, species go into genera other than *Chalcis*.

Accordingly, a list has been prepared that includes all Mexican species that were described or placed in *Smicra*, or *Smiera*, before 1923. This list is given below; in it a heading gives the present generic placement of each species. This is followed by the reference to the original description, information about the type-specimens, and, for some, pertinent ancillary information. The species are arranged alphabetically by species names. I have seen the types of all of these species except for a few that seem to be lost. Many of the generic placements in this list have not previously been published. The following abbreviations are used for repositories of types: ANSP for Academy of National Sciences, Philadelphia; BM for British Museum (Natural History), London; MHNP for Musée d'Histoire Naturelle, Paris; USNM for National Museum of Natural History, Washington, D.C.

Mexican Species Described or Placed in *Smicra*, or  
*Smiera*, Spinola Before 1923

*Spilochalcis abdominalis* (Walker), new combination  
*Smiera abdominalis* Walker, 1861, J. Entomol. 1:177, ♂. Type: BM 5.480.  
*Spilochalcis*, *xanthostigma* species group.

*Spilochalcis ambigua* (Cresson), new combination

*Smicra ambigua* Cresson, 1872, Trans. Amer. Entomol. Soc. 4:44, ♂. Type: ANSP 1807. Synonym of *abdominalis* Walker. NEW SYNONYMY.

*Spilochalcis ardens* (Cameron), new combination

*Smicra ardens* Cameron, 1897, Ann. Mag. Nat. Hist. (Ser. 6) 19:262, ♀. Type: BM 5.209. *Spilochalcis, femorata* species group.

*Chalcis armillata* (Cameron), new combination

*Smicra armillata* Cameron, 1897, Ann. Mag. Nat. Hist. (Ser. 6) 19:264, ♂. Type: BM 5.169. Synonym of *barbara* Cresson. NEW SYNONYMY.

*Spilochalcis azteca* (Cresson), new combination

*Smicra azteca* Cresson, 1872, Trans. Amer. Entomol. Soc. 4:51, ♂. Type: ANSP 1820. *Spilochalcis, nigricornis* species group.

*Spilochalcis centralis* (Cameron), new combination

*Smicra centralis* Cameron, 1884, Biol. Cent.-Amer., Hym., v. 1, p. 89, pl. 5, fig. 6, ♀. Type: BM 5.214. *Spilochalcis, femorata* species group.

*Thaumapus coccinatus* (Cresson), new combination

*Smicra coccinata* Cresson, 1872, Trans. Amer. Entomol. Soc. 4:48, ♂. Type: ANSP 1809.

*Metadontia compactilis* (Cresson), new combination

*Smicra compactilis* Cresson, 1872, Trans. Amer. Entomol. Soc. 4:50, ♀. Type: ANSP 1818.

*Smicra conjungens* Walker

*Smicra conjungens* Walker, 1871, Notes on Chalc., p. 53, ♂. Type: Supposed to be in MHNP, but could not be located; not in BM. Probably *Spilochalcis*.

*Spilochalcis dimidiata* (Sichel), new combination

*Conura dimidiata* Sichel, 1865, Ann. Soc. Entomol. de France (Ser. 4) 5:360. 390, "♀" = ♂. Type: MHNP, 1 ♂. Placed in *Smicra* by Cresson, 1872, Trans. Amer. Entomol. Soc. 4:55. *Spilochalcis, dimidiata* species group.

*Chalcis divisa* (Walker)

*Smicra divisa* Walker, 1861, J. Entomol. 1:178, ♀, ♂. Type: BM 5.464.  
Placed in *Chalcis* by Burks, 1940, Proc. US Natl. Mus. 88:246.

*Spilochalcis erythrina* (Walker), new combination

*Smicra erythrina* Walker, 1861, J. Entomol. 1:179, "♀" = ♂. Type: BM 5.469. *Spilochalcis, femorata* species group. *Spilochalcis clora* Burks, 1940, Proc. US Natl. Mus. 88:306, ♂, is a synonym. NEW SYNONYMY.

*Spilochalcis exornata* (Cresson)

*Smicra exornata* Cresson, 1872, Trans. Amer. Entomol. Soc. 4:50, ♂. Type: ANSP 1817. *Spilochalcis, transitiva* species group. Placed in *Spilochalcis* by Burks, 1940, Proc. US Natl. Mus. 88:206.

*Spilochalcis fasciola* (Cameron), new combination

*Smicra fasciola* Cameron, 1897, Ann. Mag. Nat. Hist. (Ser. 6) 19:264, ♀. Type: BM 5.212. *Spilochalcis, femorata* species group.

*Spilochalcis flammeola* (Cresson)

*Smicra flammeola* Cresson, 1872, Trans. Amer. Entomol. Soc. 4:48, ♀, ♂. Type: ANSP 1811. *Spilochalcis, nigricornis* species group. Placed in *Spilochalcis* by Burks, 1940, Proc. US Natl. Mus. 88:296.

*Spilochalcis flavovariegata* (Cameron), new combination

*Smicra flavovariegata* Cameron, 1884, Biol. Cent.-Amer., Hym., v. 1, p. 92, ♀, ♂. Type: BM 5.205 (labelled *fulvovariegata*). *Spilochalcis, femorata* species group.

*Spilochalcis geniculata* (Cameron), new combination

*Smicra geniculata* Cameron, 1884, Biol. Cent.-Amer., Hym., v. 1, p. 87, ♂. Type: BM 5.201. *Spilochalcis, femorata* species group.

*Spilochalcis juxta* (Cresson)

*Smicra juxta* Cresson, 1872, Trans. Amer. Entomol. Soc. 4:54, ♀. Type: ANSP 1808. *Spilochalcis, xanthostigma* species group. Placed in *Spilochalcis* by Burks, 1940, Proc. US Natl. Mus. 88:311.

*Thaumapus lamyus* (Walker), new combination

*Smicra lamyus* Walker, 1842, Entomologist for 1842, p. 337, ♀. Type: BM 5.503.

*Spilochalcis lauta* (Cresson), new combination

*Smicra lauta* Cresson, 1872, Trans. Amer. Entomol. Soc. 4:45, ♀. Type: ANSP 1806. *Spilochalcis*, *xanthostigma* species group.

*Spilochalcis lecta* (Cresson)

*Smicra lecta* Cresson, 1872, Trans. Amer. Entomol. Soc. 4:44, ♀, ♂. Type: ANSP 1805. *Spilochalcis*, *xanthostigma* species group. Placed in *Spilochalcis* by Burks, 1940, Proc. US Natl. Mus. 88:317.

*Spilochalcis lenta* (Cresson), new combination

*Smicra lenta* Cresson, 1872, Trans. Amer. Entomol. Soc. 4:52, ♂. Type: ANSP 1821. *Spilochalcis*, *lenta* species group.

*Spilochalcis mendica* (Cresson)

*Smicra mendica* Cresson, 1872, Trans. Amer. Entomol. Soc. 4:41, ♂. Type: ANSP 1802. *Spilochalcis*, *side* species group. Placed as synonym of *Spilochalcis flavopicta* (Cresson) by Burks, 1940, Proc. US Natl. Mus. 88:331.

*Psychidosmicra mexicana* (Cresson), new combination

*Smicra mexicana* Cresson, 1872, Trans. Amer. Entomol. Soc. 4:42, ♀, ♂. Type: ANSP 1804.

*Thaumapus mirandus* (Cresson), new combination

*Smicra miranda* Cresson, 1872, Trans. Amer. Entomol. Soc. 4:49, ♀, ♂. Type: ANSP 1813.

*Spilochalcis montezuma* (Cresson), new combination

*Smicra montezuma* Cresson, 1872, Trans. Amer. Entomol. Soc. 4:51, ♂. Type: ANSP 1819. *Spilochalcis*, *nigricornis* species group.

*Spilochalcis nigromaculata* (Cameron), new combination

*Smicra nigromaculata* Cameron, 1884, Biol. Cent.-Amer., Hym., v. 1, p. 83, ♀, ♂. Type: BM 5.197. *Spilochalcis*, *femorata* species group.

*Spilochalcis obtusiventris* (Cameron), new combination

*Smicra obtusiventris* Cameron, 1884, Biol. Cent.-Amer., Hym., v. 1, p. 93, ♀, ♂. Type: BM 5.207. *Spilochalcis*, *femorata* species group.



*Metadontia octodentata* (Cameron), new combination

*Smicra octodentata* Cameron, 1884, Biol. Cent.-Amer., Hym., v. 1, p. 82.  
Type: BM 5.230. Type badly broken, but appears to be *Metadontia*.

*Smicra pompiloides* Walker

*Smicra pompiloides* Walker, 1871, Notes on Chalc., p. 53, ♂. Type: Supposed to be in MHNP, but could not be located; not in BM. Probably *Thaumapus*.

*Spilochalcis pylas* (Walker), new combination

*Smicra pylas* Walker, 1842, Entomologist for 1842, p. 337, ♀. Type: BM 5.482. *Spilochalcis*, *xanthostigma* species group. This species may be from Brazil rather than from Mexico.

*Spilochalcis sexdentata* (Cameron), new combination

*Smicra sexdentata* Cameron, 1884, Biol. Cent.-Amer., Hym., v. 1, p. 81, ♀.  
Type: BM 5.234. Type in very poor condition. *Spilochalcis*, *sexdentata* species group.

*Spilochalcis sicheli* (Cameron), new combination

*Comura scutellaris* Sichel, 1865, Ann. Soc. Entomol. de France (Ser. 4) 5: 359, 388, ♀. Preoccupied.  
*Smicra sicheli* Cameron, 1884, Biol. Cent.-Amer., Hym., v. 1, p. 82. N. name. Type: MHNP. A synonym of *Spilochalcis dux* (Walker). NEW SYNONYMY.

*Spilochalcis tenebrosa* (Walker), new combination

*Smicra tenebrosa* Walker, 1861, J. Entomol. 1:181, ♂. Type: BM 5.454.  
*Spilochalcis*, *xanthostigma* species group.

*Spilochalcis tolteca* (Cresson), new combination

*Smicra tolteca* Cresson, 1872, Trans. Amer. Entomol. Soc. 4:42, ♀. Type: ANSP 1822. *Spilochalcis*, *femorata* species group.

*Spilochalcis toluca* (Cresson), new combination

*Smicra toluca* Cresson, 1872, Trans. Amer. Entomol. Soc. 4:42, ♀. Type: ANSP 1803. *Spilochalcis*, *toluca* species group.

## Key to Mexican Species

1. Female; ovipositor visible on venter of gaster; antennal scape slender 2
  - Male; apical gastral sternite flattened and with a median, apical indentation; antennal scape broadened 8
2. Basal tooth of hind femur much larger than following teeth, Figs. 6, 7; petiole mostly or entirely yellow; malar suture obsolete 3
  - Basal tooth of hind femur little if any larger than following teeth, Fig. 4; malar suture mostly or completely present 5
3. Thoracic dorsum completely black; petiole short, only  $1\frac{1}{2}\times$  as long as wide; width of malar space  $\frac{2}{3}$  height of compound eye *megalomis* Burks
  - Thoracic dorsum black with yellow spots or cross stripes; petiole longer, 2 to  $2\frac{1}{2}\times$  as long as wide; width of malar space  $\frac{1}{2}$  height of compound eye 4
4. Scutellum with a median, longitudinal depression; apical scutellar lamina depressed on meson *divisa* (Walker)
  - Scutellum not mesally depressed; apical scutellar lamina not depressed on meson *lasia* Burks
5. Hind femur lacking inner tooth; frons entirely black *nodis*, new species
  - Hind femur with a distinct inner tooth; frons black with yellow spots or entirely reddish brown 6
6. Petiole almost entirely smooth, with only inconspicuous reticulations near base; dorsum of thorax reddish brown *barbara* (Cresson)
  - Petiole with strong, rugose, longitudinal carinae; dorsum of thorax black 7
7. Malar suture extending straight ventrad from compound eye for  $\frac{2}{3}$  its length, then curving obliquely toward base of mandible; width of malar space  $\frac{1}{2}$  height of compound eye *neptis* Burks
  - Malar suture extending straight from compound eye to base of mandible; width of malar space  $\frac{1}{3}$  height of compound eye *colpotis*, new species
8. Malar suture obsolete 9
  - Malar suture present, distinct 11
9. Body densely covered with conspicuous, long setae; basal gastral tergum with a dorsal yellow spot *lasia* Burks
  - Body less densely covered with shorter setae; gaster lacking a dorsal yellow spot 10
10. Hind femur narrow, with widely spaced, triangular teeth, Fig. 8; petiole  $4\times$  as long as wide *celis*, new species
  - Hind femur more globose, with teeth slender and more closely set, Fig. 5; petiole  $3\times$  as long as wide *divisa* (Walker)

11. Petiole smooth, occasionally with faint striae near base  
*barbara* (Cresson)  
 - Petiole with strong, rugose, longitudinal carinae 12
12. Hind femur lacking inner tooth; fore tarsal claw with 8 teeth on basal enlargement *nodis*, new species  
 - Hind femur with an inner tooth; fore tarsal claw with 3 teeth on basal enlargement *neptis* Burks

*Chalcis megalomis* Burks

*Chalcis megalomis* Burks, 1940, Proc. US Natl. Mus. 88:250, ♀.

*Female*.—5.0–8.0 mm. Head and thorax black, with 2 spots on parascrobal spaces of head, base and  $\frac{2}{3}$  of ventral margin of hind femur, and petiole, yellow; apices of fore and middle femora, inner surface of fore and middle tibiae, all tarsi, wings, and gaster tan or brown. Antennae inserted slightly ventrad of center of frons, apical  $\frac{1}{4}$  of scape projecting above level of vertex; width of malar space  $\frac{2}{3}$  height of compound eye, malar suture wanting; left mandible with 1 large, acute dorsal tooth and 1 blunt ventral tooth (worn mandibles may appear almost edentate), right mandible with 3 nearly equal, rounded teeth; diameter of lateral ocellus  $\frac{1}{3}$  length of ocellular line. Anterolateral angle of pronotum strongly produced, carinate; prepectus concealed; scutellum not flattened and lacking a median, longitudinal depression; hind femur relatively broad, ventral margin with basal tooth large and long, and with 8 to 10 following, small teeth; apex of hind tibia not quite reaching trochanter when tibia is folded against femur. Propodeum with rugose, irregular carinae, a pair of median, slightly irregular, longitudinal carinae in basal  $\frac{1}{2}$ ; petiole smooth and unsculptured, its length  $1\frac{1}{2}\times$  as great as its width; gaster slightly shorter than hind femur; apex of hypopygium projecting, isolated from 8th tergum.

*Male*.—Unknown.

*Distribution*.—Michigan, Illinois, Iowa, Wyoming, Colorado, Oregon; Mexico. *Mexican Distribution*.—Sonora.

*Host*.—*Stratiomys* sp.

*Type*.—Illinois Natural History Survey, Urbana, Illinois.

*Chalcis divisa* (Walker)

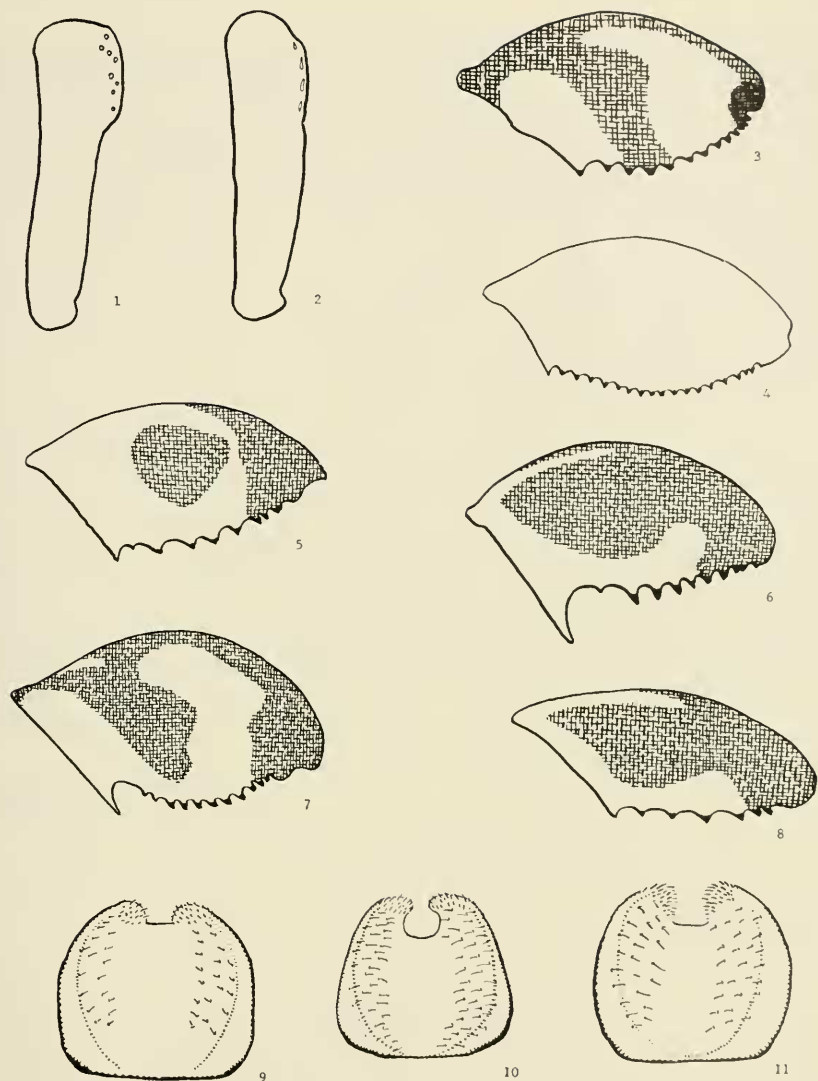
(Figs. 5, 6, 10)

*Smiera divisa* Walker, 1861, J. Entomol. 1:178, ♀, ♂.

*Chalcis divisa* (Walker) Burks, 1940, Proc. US Natl. Mus. 88:246; Daly, 1963, Ann. Entomol. Soc. Amer. 56:303 (morphology).

*Female*.—7.0–8.0 mm. Black with yellow markings; parascrobal spaces and interantennal triangle, posterior margin of pronotum, apices of fore





Figs. 1-2. Male antennal scape. 1, *Chalcis nodis*. 2, *C. cclis*. Figs. 3-8. Hind femur. 3, *C. nodis*, female. 4, *C. barbara*, female. 5, *C. divisa*, male. 6, *C. divisa*, female. 7, *C. lasia*, female. 8, *C. cclis*, male. Figs. 9-11. Male apical gastral sternite. 9, *C. nodis*. 10, *C. divisa*. 11, *C. cclis*.

and middle femora, bases of fore and middle tibiae, base and angled dorsal and ventral stripes on outer surface of hind femur, large vertical stripe near apex of inner face of hind femur, spot near base of hind tibia, apex of scutellum, and petiole, yellow. Antennae inserted slightly ventrad of center of frons, scape long, its apex exceeding level of vertex by  $\frac{1}{2}$  its length;

width of malar space  $\frac{3}{4}$  height of compound eye; malar suture obsolete; each mandible with 3 teeth; posterior carina of gena extending from base of mandible to middle of compound eye; diameter of lateral ocellus  $\frac{1}{2}$  length of ocellocular line. Anterolateral angle of pronotum strongly produced, carinate; prepectus concealed; scutellum flattened and with a vaguely defined, longitudinal, median depression; hind femur relatively broad, ventral margin with a large and long basal tooth and 6 to 10 small following teeth, Fig. 6; apex of hind tibia extending to trochanter when tibia is folded against femur. Propodeum coarsely carinate, with a median, longitudinal carina in basal  $\frac{1}{2}$ ; petiole smooth, unsculptured, its length 2 to  $2\frac{1}{2} \times$  its width; gaster slightly shorter than hind femur; apex of hypopygium projecting, isolated from 8th tergum.

*Male*.—6.5–8.0 mm. Black with more extensive yellow markings than in ♀; entire frons except for small, triangular area just dorsal to clypeus, all of dorsal surface of pronotum except for narrow space at anterior margin, tegulae, posterior  $\frac{3}{4}$  of scutellum, almost entire inner surfaces of fore and middle femora and tibiae, broad basal, dorsal, and ventral areas of outer surface of hind femur, and petiole, yellow. Antennal scape broadened from base to apex, the apex barely exceeding level of vertex; width of malar space  $\frac{1}{2}$  height of compound eye. Anterolateral angle of pronotum less strongly produced than in ♀; ventral margin of hind femur lacking an enlarged basal tooth, 7 to 10 small, relatively inconspicuous teeth present, Fig. 5. Gaster slightly longer than hind femur; apical gastral sternite shallowly excavated at hind margin, Fig. 10.

*Distribution*.—Kansas, Oklahoma, Texas, Arizona, Oregon, California; Mexico. *Mexican Distribution*.—Matamoros, Coahuila; Hermosillo, Sonora; San Jose del Cabo, Baja California Sur; Culiacan, Sinaloa; Cuernavaca, Morelos; Petlalcingo, Puebla; Totolapan, Oaxaca; Matias Romero, Oaxaca; Orizaba, Veracruz.

*Type*.—BM 5.464.

### *Chalcis lasia* Burks

*Chalcis lasia* Burks, 1940, Proc. US Natl. Mus. 88:28, ♀, ♂.

*Female*.—6.0–8.0 mm. Black, with large spots on parascrobal areas of head, a pair of lateral, triangular spots on pronotum, tegulae, a pair of small lateral spots on praescutum, a pair of submarginal, apical spots on scutellum, apices of fore and middle femora, bases of fore and middle tibiae, fore and middle tarsi, wide basal and median areas on outer face of hind femur, subapical area on inner face of hind femur, subbasal spot on hind tibia, and petiole, yellow; all tarsi tan, with apical segment usually slightly darker. Head, body and appendages densely covered with silver colored pubescence. Antennae inserted slightly ventral to center of frons, apex of scape barely exceeding level of vertex; width of malar space  $\frac{1}{2}$  height

of compound eye; malar furrow wanting; left mandible with 2 blunt teeth, right mandible with an acute dorsal tooth and 2 ventral, blunt teeth; diameter of posterior ocellus  $\frac{1}{2}$  length of ocellocular line. Anterolateral angle of pronotum not projecting, covered with dense hair; prepectus concealed; scutellum subflattened, lacking median, longitudinal depression; hind femur relatively broad, ventral margin with basal tooth long and large, 11 to 14 minute, triangular following teeth present, Fig. 7; apex of hind tibia projecting over trochanter when tibia is folded against femur. Propodeum with rugose, carinate sculpture, a median longitudinal carina present in basal  $\frac{1}{2}$  of propodeum, this bifurcating toward apex; petiole very faintly sculptured, its surface not quite smooth, petiole  $1\frac{1}{2}\times$  as long as wide; gaster slightly shorter than hind femur; apex of hypopygium projecting, isolated from 8th tergum.

*Male*.—7.0 mm. Fore and middle legs entirely yellow except for small areas at bases of femora, yellow areas on hind femora and tibiae more extensive than in ♀; gaster with a dorsal yellow spot in middle of 1st gastral tergum. Antennal scape broadened from base to apex,  $\frac{1}{4}$  its length projecting above level of vertex; width of malar space  $\frac{1}{2}$  height of compound eye. Basal tooth of hind femur not larger than following teeth. Petiole longer and more slender than in ♀, its length  $3\times$  its width; gaster and hind femur equal in length; apical gastral sternum shallowly excavated on meson of posterior margin.

*Distribution*.—Arizona, California; Mexico. *Mexican Distribution*.—Baja California Norte.

*Type*.—USNM 54365.

*Chalcis nodis* Burks, new species  
(Figs. 1, 3, 9)

This species is similar to *Chalcis flebilis* (Cresson), a common species in the northeastern United States and southeastern Canada. Both have the ovipositor conspicuously exerted, the hind femur lacks an inner tooth, and the male antennal scape is spatulate at the apex, Fig. 1. They differ in that *nodis* has the malar suture incomplete, the female petiole has more rugose sculpture, the male middle tibial spur is lacking, and the posterior margin of the male apical gastral sternum has a shallow median indentation, rather than having a narrow and deep one.

*Female*.—5.0 mm. Black; tegulae yellow and yellow spots at dorsolateral areas of pronotum, on lateral margins of praescutum near posterior margin, at posterolateral areas of scutellum, near apices of fore femur and middle femur, on apical  $\frac{1}{2}$  and basal  $\frac{1}{3}$  of outer face of hind femur, and near base of hind tibia; metepisternum, lateral areas of propodeum, and base of gaster red brown. Wings with membrane mostly hyaline, with dense, brown trichiae, and forewing with vague brown shading at posterior margin of marginal vein, around stigmal vein, and on paths of obsolete veins M and

Cu. Pubescence silvery. Antenna inserted slightly ventral to center of frons, antennal scape exceeding by  $\frac{1}{2}$  its length level of posterior ocelli; ring segment  $\frac{1}{2}$  as long as pedicel, 1st funicular  $2\times$  as long as pedicel, 7th funicular  $1\frac{1}{4}\times$  as long as pedicel, club as long as 1st funicular; interantennal projection with strong vertical carinae, median carina continued into scrobe cavity; width of malar space  $\frac{2}{3}$  as great as height of compound eye, malar furrow straight, extending half-way to mouth opening; right mandible with 1 large, semi-acute dorsal tooth and 2 shorter, blunt ventral teeth, all 3 teeth equal in width at the base; left mandible with 1 large, semi-acute dorsal tooth and 1 truncate ventral tooth, dorsal tooth the wider at base; diameter of posterior ocellus  $\frac{2}{3}$  ocellocular distance. Dorsum of thorax with short, decumbent, relatively obscure pubescence; more dense, longer pubescence present at posterolateral angles of pronotum; notaulices distinct throughout; praescutum with irregular, coalescing punctures; prepectus minute, barely visible at margin of pronotum; middle tibial spur wanting; hind femur lacking inner tooth, outer ventral margin with 13 to 15 minute teeth of equal size, Fig. 3; hind tarsal claw elongate, basal enlargement with 3 long, slender teeth. Propodeum conspicuously carinate, a short, longitudinal carina present on meson; petiole  $2\times$  as long as wide, dorsal surface sculptured with vague, longitudinal carinae; gaster sparsely setose, its length equal to hind femur; cerci oval, located near posterior margin of 7th gastral tergum; hypopygium exerted, its apex isolated from 6th gastral tergum.

*Male*.—Dorsum of thorax entirely black, metepisternum and propodeum also black; color otherwise as in ♀. Antennal scape spatulate at apex, Fig. 1; funiculus and club narrower and more elongate than in ♀, ring segment  $\frac{1}{2}$  as long as pedicel, 1st funicular  $3\times$  as long as pedicel, 7th funicular  $2\frac{1}{2}\times$  as long as pedicel, club  $3\times$  as long as 1st funicular; width of malar space  $\frac{1}{2}$  as great as height of compound eye. Fore tarsal claw with a dense comb of 8 bristles on basal enlargement. Petiole  $2\times$  as long as wide, less coarsely sculptured than in ♀; gaster  $\frac{1}{2}$  as long as hind femur; apical gastral sternite shallowly incised at apex, Fig. 9.

Described from 4 female, 1 male specimens. *Holotype*, ♀, USNM no. 73685, Mazatlan, Sinaloa, Mexico, collected August 15–20, 1962, H. E. Evans; 1 paratype ♀, same data; 1 paratype ♂, Veracruz, Mexico, July 1959, N. L. H. Krauss; 2 paratype ♀♀, Manzanillo, Colima, Mexico, July 31, 1922, C. H. Ballou. All specimens in USNM Collection.

*Chalcis barbara* (Cresson)  
(Fig. 4)

*Smicra rufofemorata* Cresson, 1872, Trans. Amer. Entomol. Soc. 4:36, 39, ♂. Preoccupied.

*Smicra barbara* Cresson, 1872, Trans. Amer. Entomol. Soc. 4:37, 47. "♂"  
= ♀.

*Chalcis barbara* (Cresson) Burks, 1940, Proc. US Natl. Mus. 88:255.

*Smicra armillata* Cameron, 1897, Ann. Mag. Nat. Hist. (Ser. 6) 19:264. ♂.  
NEW SYNONYMY.

*Female*.—5.0–8.0 mm. Light reddish brown, with antennal flagellum, mandibular teeth, and apex of ovipositor usually dark brown to black; venter of thorax, hind femora and tibiae, propodeum, and basal  $\frac{1}{2}$  of petiole sometimes dark brown. Antennae inserted slightly ventrad of center of frons, apex of scape barely exceeding level of vertex; width of malar space  $\frac{2}{3}$  height of compound eye; malar suture extending straight ventrad from compound eye for  $\frac{1}{2}$  its length and then curving toward mandible; left mandible with 1 large dorsal tooth and 1 minute ventral tooth, right mandible with 3 blunt teeth; diameter of posterior ocellus  $\frac{1}{2}$  length of ocellocular line. Anterolateral angle of pronotum with a minute, rounded projection; prepectus minute but visible at margin of pronotum; scutellum rounded, not depressed on meson; hind femur with a sharp inner tooth, outer ventral margin with 16–20 minute, equal-sized teeth, Fig. 4; apex of hind tibia not reaching trochanter when tibia is folded against femur. Propodeum with median, apical and lateral irregular, carinate reticulations, 2 large basolateral areas almost smooth; petiole 2× as long as wide, surface almost smooth, faint reticulations at base and a pair of laterodorsal, longitudinal carinae present; gaster and hind femur equal in length; apex of hypopygium exerted, isolated from 8th tergum.

*Male*.—5.0–7.0 mm. Black, with fore and hind femora, all tarsi, and basal  $\frac{1}{2}$  of gaster reddish brown. Antennal scape enlarged from base to apex,  $\frac{1}{4}$  its length extending above level of vertex; width of malar space  $\frac{1}{2}$  height of compound eye; diameter of lateral ocellus  $\frac{2}{3}$  length of ocellocular line. Gaster slightly shorter than hind femur; apical gastral sternite with posterior margin broadly and shallowly excavated on meson.

*Distribution*.—New Hampshire, New Jersey, Florida, Michigan, Illinois, Minnesota, Iowa, Missouri, Arkansas, North Dakota, Kansas, Texas, Wyoming, Colorado; Mexico. *Mexican Distribution*.—Taken in aircraft from Mexico at Quarantine Stations at Brownsville and Laredo, Texas; Pte. de Ixtla, Morelos; Cuernavaca, Morelos; Rosario, Sinaloa; El Bonito 11 km south of Ciudad Vailles, San Luis Potosi.

*Host*.—*Odontomyia* sp.

*Type*.—ANSP 1790.



*Chalcis neptis* Burks

*Chalcis neptis* Burks, 1940, Proc. US Natl. Mus. 88:251, ♀, ♂.

*Female*.—5.0–6.0 mm. Black, with a pair of spots on parascrobal spaces on head, apices of fore and middle femora, bases of fore and middle tibiae, and an oblique stripe near base of hind femur, yellow; apex on outer face of hind femur and almost entire inner face of hind femur, brown. Antennae inserted slightly ventrad of center of frons, scape with its apex just reaching level of vertex; width of malar space  $\frac{1}{2}$  height of compound eye; malar furrow present, straight for dorsal  $\frac{2}{3}$  its length, then recurved obliquely toward mandibular base; left mandible with 1 large, blunt, dorsal tooth and 1 smaller, blunt, ventral tooth, right mandible with 1 acute, dorsal tooth and 2 blunt, ventral teeth; diameter of posterior ocellus  $\frac{2}{3}$  length of ocellocular line. Anterolateral angle of pronotum projecting, toothlike; prepectus concealed; praescutum with a median, longitudinal depression, this extending onto scutellum as a more vague longitudinal depression; hind femur relatively broad, outer ventral margin with 14 to 16 small teeth, basal tooth slightly the larger; apex of hind tibia extending only  $\frac{3}{4}$  the distance from base of femur to trochanter when tibia is folded against the femur. Propodeum covered with coarse, rugulose carinae, a somewhat irregular median, longitudinal carina in basal  $\frac{1}{2}$  of propodeum; petiole with very strong, longitudinal carinae, length of petiole  $2\frac{1}{4}$  to  $2\frac{1}{2}\times$  as great as its width; gaster and hind femur equal in length; apex of hypopygium projecting, isolated from 8th tergum.

*Male*.—5.5–6.0 mm. Inner face of fore and middle femora and tibiae and basal, dorsal, and subapical stripes on outer face of hind femur yellow. Antennal scape broadened from near base to apex, the apex not quite reaching level of vertex; width of malar space  $\frac{1}{4}$  height of compound eye; diameter of posterior ocellus equal to length of ocellocular line. Lengths of gaster and hind femur equal; apical sternite of gaster with a small median, apical notch.

*Distribution*.—Nebraska, Idaho, Colorado, New Mexico, Utah, Arizona, Washington, Oregon, California; Mexico. *Mexican Distribution*.—Sonora; Durango.

*Type*.—USNM 54366.

*Chalcis colpotis* Burks, new species

This species agrees with *Chalcis neptis* Burks in having a rugose petiole, 2 yellow spots on the frons, the head otherwise entirely black, the thoracic dorsum entirely black, the praescutum with a longitudinal, median depression, and the posterior femur with a sharp, well-defined inner tooth. They differ in that *colpotis* has the malar suture straight rather than angled in

the middle, the petiole is shorter and broader, and the width of the malar space is  $\frac{1}{3}$ , rather than  $\frac{1}{2}$ , as great as the height of the compound eye.

*Female*.—5.0 mm. Black with yellow spots; yellow markings at margins of compound eyes on parascrobal spaces of frons, at apices of fore and middle femora, at bases of fore and middle tibiae, and near apex of hind femur; base of outer side and entire inner face of hind femur tan; middle of outer face of hind femur brown. Wings faintly shaded with brown, darker brown on paths of obsolete veins Rs, M, and Cu. Pubescence silvery. Antennae inserted slightly ventral to center of frons, apex of antennal scape barely exceeding level of posterior ocelli; ring segment  $\frac{1}{2}$  as long as pedicel, 1st funicular  $2\times$  as long as pedicel, 7th funicular as long as pedicel, club as long as 1st funicular; interantennal projection with a median vertical carina, this continued into scrobe cavity and extending to anterior ocellus; width of malar space  $\frac{1}{3}$  as great as height of compound eye, malar furrow straight, extending from eye to mouth opening; right mandible with 1 large, semi-acute dorsal tooth and 2 smaller, blunt ventral teeth; left mandible with 1 large, semi-acute dorsal tooth and 1 short, blunt ventral tooth; diameter of posterior ocellus  $\frac{2}{3}$  ocellocular distance. Dorsum of thorax with relatively long, dense pubescence; notaulices distinct throughout and strongly depressed below level of dorsum; praescutum with a median, longitudinal depression; prepectus not visible; middle tibial spur absent; hind femur with sharp, well-defined inner tooth, outer ventral margin with 15 minute, closely set teeth, median teeth slightly the larger; hind tarsal claw elongate, basal enlargement with 3 minute, triangular teeth. Propodeum roughly carinate, an irregular median pit near dorsal margin, this usually with a median, vertical carina; petiole with irregular, longitudinal rugae, length of petiole  $1\frac{1}{4}\times$  its width; gaster laterally densely setose on 2nd to apical segments; cerci oval, located near posterior margin of 7th tergum; hypopygium exerted, its apex isolated from 8th gastral tergum.

*Male*.—Unknown.

Described from 7 specimens. *Holotype*, ♀, USNM no. 73686, Yuriria, 1,980 m elev., Guanajuato, Mexico, August 7, 1962, H. E. Evans; 3 paratype ♀♀, same data; 1 paratype ♀, 33 km north of Acambaro, 2,310 m elev., Guanajuato, Mexico, H. E. Evans; 1 paratype ♀, 8 km east of Durango, Durango, Mexico, August 3, 1952, J. D. Lattin; 1 paratype ♀, Mexico, collection W. M. Giffard, 459. Specimens in USNM and California Academy of Sciences.

*Chalcis celis* Burks, new species  
(Figs. 2, 8, 11)

This species agrees with *divisa* (Walker) in lacking a malar carina, in lacking an inner tooth on the hind femur, in having yellow spots on the

frons of the head and at the apex of the scutellum, and in having the petiole almost entirely yellow; they differ in that *celis* has a longer, more slender petiole, the hind femur is narrower (Figs. 5, 8) and has fewer, more widely spaced teeth.

*Female*.—Unknown.

*Male*.—7.0 mm. Black, with yellow and tan markings; lateral areas of frons and interantennal projection, posterior dorsal margin of pronotum, tegulae, large posterolateral spots on scutellum, inner surface of fore tibia, dorsal stripe on basal  $\frac{1}{2}$  of hind femur, outer basal and ventral areas of hind femur, large apical spot on inner face of hind femur, basal  $\frac{1}{3}$  of hind tibia, and all of petiole except ventrobasal  $\frac{1}{3}$ , yellow; apical halves of inner surface of fore and middle femora, tan; wings yellowish tan, forewing slightly darkened below marginal vein, around stigmal vein, and along paths of obsolete veins M and Cu. Antennae inserted in center of frons, scape enlarged from base to apex, Fig. 2, and  $\frac{1}{3}$  its length projecting above level of posterior ocelli; pedicel  $2\times$  as long as ring segment, 1st funicular segment  $3\frac{1}{2}\times$  as long as pedicel, 7th funicular  $\frac{5}{6}$  as long as 1st, club  $1\frac{1}{2}\times$  as long as 1st funicular; interantennal projection umbilicate, with faint carina at apex only; width of malar space  $\frac{1}{2}$  height of compound eye; malar furrow obsolete. Anterolateral angles of pronotum produced, carinate; pubescence dense, long; prepectus concealed; apex of scutellum depressed on meson; hind femur relatively narrow and outer ventral margin with 7 small, widely spaced teeth, Fig. 8; inner tooth absent; apex of hind tibia reaching trochanter when the tibia is folded against the femur. Propodeum coarsely and irregularly carinate, a prominent median, longitudinal carina present; petiole smooth, unsculptured, broader at apex than at base, its length  $4\times$  its maximum width; gaster as long as hind femur, gastral segments 2 to 7 moderately setose; apical gastral sternite with a quadrate, median excavation at apex, Fig. 11.

Described from 1 specimen. *Holotype*, ♂, San Cristobal de las Casas, 2,160 m elev., Chiapas, Mexico, August 3, 1966, D. E. Breedlove and J. Emmet. Deposited in California Academy of Sciences.

#### Acknowledgments

I am indebted to Dr. R. O. Schuster, University of California, Davis; Dr. L. E. Caltagirone, University of California, Berkeley; and Dr. Paul Arnaud, California Academy of Sciences, San Francisco, for lending material of *Chalcis* for study. All the Mexican material of *Chalcis* in the USNM was used in preparing this paper; much of this material from Mexico had been donated several years ago by Dr. H. E. Evans.

#### Literature Cited

- Burks, B. D. 1940. Revision of the chalcid-flies of the tribe Chalcidini in America north of Mexico. Proc. US Natl. Mus. 88:237-354.

- Dalla Torre, C. G. 1898. *Catalogus Hymenopterorum*, v. 5, Chalcididae and Proctotrupidae. Leipzig. 589 pp.
- Gahan, A. B., and M. M. Fagan. 1923. The type species of the genera of Chalcidoidea or chalcid-flies. *Bull. US Natl. Mus.* 124. 173 pp.
- Schmitz, G. 1946. Chalcididae de l'Afrique Central. Congo Belge, Inst. Parcs Nat. Albert, Mission G. F. de Witte, Fasc. 48. 191 pp.
- Schremmer, F. 1960. Beitrag zur Biologie der in Stratiomyidenlarven parasitierenden Calcididen. *Entomol. Nachrichtenbl. Österreich u. Schweiz.* 12:83-89.

Systematic Entomology Laboratory, IIBIII, Agric. Res. Serv., USDA, Beltsville, Maryland 20705 (now Star Rt. 1, Box 41, Sedona, Arizona 86336).